Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Previously Presented): A method for the production of an electro-optical printed circuit board, having a number of layers with electrically conductive elements, and at least one optical layer with optically conductive elements, wherein the at least one optical layer has a polysiloxane material, and wherein structuring of the elements in a form of channel waveguides of the optical layer takes place by means of casting into a casting mold that contains the waveguide structures as a negative mold, whereby a mechanical connection between the optical layer and at least one layer of the electrically conductive printed circuit board layers is produced in direct connection with the production of the optical layer.

Claim 2 (Previously Presented): The method according to

claim 1, wherein the mechanical connection between the optical layer and the at least one layer of the electrically conductive printed circuit board layers is produced directly during the production of the elements of the optical layer.

Claim 3 (Previously Presented): The method according to claim 2, wherein the optical layer is formed from a core polysiloxane having a higher index of refraction, as well as a first polysiloxane as a superstrate layer, having a low index of refraction, and a second polysiloxane as a substrate layer, having a low index of refraction, in the form of cover layers on the core polysiloxane.

Claim 4 (Previously Presented): The method according to claim 3, wherein the first polysiloxane is applied to the core polysiloxane, which has already solidified, in liquid form, brought into connection with the at least one layer of the electrically conductive printed circuit board layers in its liquid phase, and subsequently cross-linked.

Claim 5 (Previously Presented): The method according to claim 3, wherein the second polysiloxane is applied to the core polysiloxane, which has already solidified, in liquid form, brought into connection with the at least one layer of the electrically conductive printed circuit board layers in its liquid phase, and subsequently cross-linked.

Claim 6 (Previously Presented): The method according to claim 4, wherein after cross-linking of the superstrate polysiloxane layer or the substrate layer, the at least one layer of the electrically conductive printed circuit board layers is mechanically fixed in place on the superstrate polysiloxane layer or the substrate layer.

Claim 7 (Previously Presented): The method according to claim 3, wherein pit structures of a casting mold are filled with the core polysiloxane, the core polysiloxane having a higher index of refraction, and hardened, in a first step; the first polysiloxane having a low index of refraction is applied as the superstrate layer, in a second step, in such a manner that the

superstrate layer bonds to the core polysiloxane, the superstrate layer with having the optically conductive elements situated on the superstrate layer; the superstrate layer with the optically conductive elements is separated from the casting mold, in a third step; and the second polysiloxane having a low index of refraction is applied to the core polysiloxane as the substrate layer, in a fourth step.

Claim 8 (Previously Presented): The method according to claim 3, wherein the polysiloxane substrate having the low index of refraction is produced by means of casting technology, with pit structures, in a first step; wherein the core polysiloxane having a higher index of refraction is filled into the pit structures in a second step to form a composite of polysiloxane substrate/core polysiloxane; and wherein the first polysiloxane having a low index of refraction is applied to the composite of polysiloxane substrate/core polysiloxane as the superstrate layer, in a third step.

Claim 9 (Previously Presented): The method according to

claim 3, wherein the at least one layer of the electrically conductive printed circuit board layers has micro-structured spacers on a side facing the second polysiloxane in a liquid phase of the substrate layer or the first polysiloxane in a liquid phase of the superstrate layer, respectively, which guarantee a defined thickness of the substrate layer or superstrate layer, respectively.

Claim 10 (Previously Presented): The method according to claim 1, wherein the mechanical connection between the optical layer and the at least one layer of the electrically conductive printed circuit board layers is produced subsequent to production of the optical layer.

Claim 11 (Previously Presented): The method according to claim 10, wherein the optical layer comprises at least one of a polysiloxane substrate, a polysiloxane core, and a polysiloxane superstrate and is first produced as an independent layer, and subsequently mechanically connected with one or more layers of the electrically conductive printed circuit board layers either

on one or both sides of the electrically conductive printed circuit board layers.

Claim 12 (Previously Presented): The method according to claim 11, wherein the optical layer is mechanically connected with the one or more layers of the electrically conductive printed circuit board layers via lamination or gluing.

Claim 13 (Previously Presented): The method according to claim 1, wherein the at least one optical layer with optically conductive elements is handled jointly with the at least one layer of the electrically conductive printed circuit board layers during production of the electro-optical printed circuit board.

Claim 14 (Previously Presented): The method according to claim 1, wherein adhesion promoters are used to support the mechanical connection of the polysiloxane material of the optical layer with the at least one layer of the electrically conductive printed circuit board layers.

Claim 15 (Previously Presented): The method according to claim 14, wherein a polymer layer that adheres well to the at least one layer of the electrically conductive printed circuit board layers is applied to the optical layer as an adhesion promoter.

Claim 16 (Previously Presented): The method according to claim 1, wherein a physical and/or chemical treatment of a surface of the at least one layer of the electrically conductive printed circuit board layers, said at least one layer being connected with the optical layer, is performed in order to achieve activation of the surface for improved adhesion to the optical layer.

Claim 17 (Previously Presented): The method according to claim 16, further comprising influencing adhesion properties of the at least one layer of the electrically conductive printed circuit board layers that is mechanically connected with the optical layer with regard to the optical layer via flaming with gases.

Claim 18 (Previously Presented): The method according to claim 16, further comprising influencing adhesion properties of the at least one layer of the electrically conductive printed circuit board layers that is mechanically connected with the optical layer with regard to the optical layer via plasma irradiation.

Claim 19 (Previously Presented): The method according to claim 1, wherein the optically conductive elements are structured by casting essentially at ambient temperatures.

Claim 20 (Previously Presented): The method according to claim 1, wherein during casting of the optically conductive elements, a cast optically conductive surface of the optically conductive elements is drawn off by ductors and thereby the casting mold is filled completely.

Claim 21 (Previously Presented): The method according to claim 1, wherein via casting techniques for structuring the

optically conductive elements, large-area structures of the optically conductive elements are produced.

Claim 22 (Previously Presented): The method according to claim 1, wherein the polysiloxane material has elastic properties and is unmolded from casting technology depressions having very steep walls or depressions having undercuts, without impairment, because of the elastic properties of the polysiloxane material.

Claim 23 (Previously Presented): The method according to claim 7, further comprising producing coupling elements for optical coupling of the optically conductive elements to electrically conductive elements of the electrically conductive printed circuit board layers to be functionally connected at the same time when the optical layer having the optically conductive elements is cast.

Claim 24 (Previously Presented): The method according to claim 23, wherein the pit structures for the optically conductive elements possess beveled flanks at ends of the pit structures; and

wherein the optical layer has molded segments that are metallized locally via said flanks after unmolding, and then function as integrated deflection mirrors.

Claim 25 (Previously Presented): The method according to claim 1, wherein the optically conductive elements of the optical layer contain intersections, branches, mixers, wavelength multiplexers and wavelength de-multiplexers, and switching elements.

Claim 26 (Previously Presented): The method according to claim 1, wherein the optically conductive layer made of a polysiloxane material temperature stabilizes the optical layer of the electro-optical printed circuit board without impairment of optical properties of the elements of the optical layer.

Claim 27 (Previously Presented): The method according to claim 1, wherein the printed circuit board is formed from at least one material selected from the group consisting of fiberglass-

filled epoxy resin, Kapton, Teflon and glass, the board not being provided with electrically conductive layers at all, or provided with electrically conductive layers on one side or both sides of the board.

Claim 28 (Previously Presented): The method according to claim 1, wherein the printed circuit board is provided with electrical conductor tracks on one side or both sides of the printed circuit board.

Claims 29-33 (Canceled).